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form; spores 8 in. the thekes, brown, oblong to linear, 4-locular, constricted, $\frac{15-20}{6-8}$ mic. Parasitic on *Buellia excentricum.*

PYRENULA Ach.

P. punctiformis Ach.
P. glabrata Ach.
P. lactea Mass.
P. thelaena (Ach.) Tuck.
P. nitidella Mull.

A Diatomaceous Deposit from an Artesian Well at Wildwood, N. J.

BY CHARLES S. BOYER.

An artesian well sunk recently at Wildwood, N. J., exhibits at certain depths diatomaceous deposits of unusual interest. Mr. Woolman, whose researches into the geology of artesian borings are well known, has sent me samples of earths with the request that I enumerate the diatoms found therein. The accompanying list includes specimens occurring in a bed from 78 to 180 feet deep, of which Mr. Woolman remarks in the annual report of the Geological Survey of New Jersey for 1893 (page 401) that "a corresponding clay bed does not exist beneath the beaches to the northward, if we may judge by the specimens of borings furnished from the various wells or by the records where no specimens were obtained. It was probably in some way associated with the deposits of the Delaware River delta in a somewhat recently past geological age, and before the present peninsula of Cape May was formed."

It is not the purpose of the present paper to give a list of the forms obtained from the entire series of the well boring which has reached the depth of 1245 feet, passing through beds apparently identical with the Miocene deposits noticed at Atlantic City and which have already been described, but as the fresh water forms are very numerous and as there are associated with them certain marine and brackish water species not heretofore noticed in North America, the enumeration of all the diatoms thus far seen at the depths of from 78 to 180 feet, is here given.

The occurrence of *Polymyxus coronalis* is of peculiar interest, as it has been hitherto considered as growing exclusively at the mouths of the Para and the Amazon. It is not a mere accidental form, but is abundant in the deposit in all its numerous variations. Several years ago I found one specimen in material from one of the Atlantic City wells, but supposed at the time that it might have been a waif cast upon the shore. As *Polymyxus* now flourishes only in warmer waters the conclusion must be reached that the Delaware River delta formed the deposit under conditions quite different from those existing at the present time. It is at any rate now extinct along the North Atlantic coast.

The nomenclature of the following list is based upon DeToni's Sylloge Algarum, except in a few cases.

Achnanthes Hudsonis Grun.

A. inflata (Kütz.) Grun.

A. subsessilis Ehr.

Actinocyclus Ehrenbergii Ralfs.

A. subtilis Greg.

Actinoptychus heliopelta Grun. forma minor.

Only one specimen has been noticed.

A. undulatus Ehr.

A. vulgaris Schum.

Amphora ovalis (Bréb.) Kütz. var. *gracilis* (Ehr.) V. H.

Aulacodiscus Argus Ehr.

Auliscus pruinosus Bail.

Biddulphia Rhombus Wm. Sm.

Brebissonia Boeckii (Kütz.) Grun.

I have noticed this form in material from the Saguenay River, Can.

Campylodiscus echeneis Ehr.

The habitat of this species is usually given as marine or brackish water. Van Heurck is the only authority, as far as I have noticed, who states that it occurs in fresh water. I have found several specimens in mud taken from a supply reservoir in Philadelphia, the water of which is drawn from the Schuylkill River.

Cerataulus laevis Roper.

Cocconeis placentula Ehr.

Coscinodiscus Argus Ehr.

C. excentricus Ehr.

C. fasciculatus A. Schm.
C. marginatus Ehr.
C. minor Ehr.
C. nitidulus Greg.
C. Oculus-Iridis Ehr.
C. radiatus Ehr.
C. subtilis Ehr.
Cyclotella Kützingiana Thw.
Cymbella affinis Kütz.
C. cistula (Hempr.) Kirchn.
C. cuspidata Kütz.
C. cymbiformis Ehr.
C. Ehrenbergii Kütz.
C. gastroides Kütz.
C. lanceolata (Ehr.) Kirchn.
C. tumida (Breb.) V. H.
Encyonema ventricosum Kütz.
Cystopleura (*Epithemia*) *Argus* (Ehr.) Kunze.

An abnormal form with flexuose outline has been noticed.

C. gibba (Ehr.) Kunze.
C. gibberula (Ehr ?) Kunze.
C. Musculus (Kütz.) Kunze.
C. Musculus constricta (Bréb.) V. H.
C. Sorex (Kütz.) Kunze.
C. Zebra (Ehr.) Kunze.
Eunotia Arcus Ehr.
E. diodon Ehr.
E. impressa Ehr.
E. major (W. Sm.) Rab.
E. parallela Ehr.
E. pectinalis (Dillw ?) Rab.
E. praerupta Ehr.
E. robusta Ralfs.
E. tetraodon Ehr.
E. triodon Ehr.
Gomphonema acuminatum coronatum Ehr.
G. Augur Ehr.
G. capitatum Ralfs.

G. geminatum (Lyngb.) Ag.
G. gracile Ehr.
G. lanceolatum Kütz.
G. olivaceum (Lyngb.) Kütz.
G. turgidum Ehr.
G. Vibrio Ehr.
Hyalodiscus stelliger Bail.
H. subtilis Bail.

HYDROSERA (TERPSINOE ?) NOVAE-CAESAREAE Boyer n. sp.

At first sight this species might appear to be a variety of *Hydrosera* (*Triceratium*) *trifoliata* Cleve, but a close comparison will show that the two are distinct.

Triangular, sides concave, *angles broad at the base*, *equally divided* into three projections, surface *sparsely punctate.* In Cleve's species the angles are cuneate and the middle lobe or tooth is narrower than the two outer, while the punctae are quite evident except at the center of the valve. There is a marked difference in general appearance, the New Jersey form being much less robust than that from New Zealand. It is quite common in the deposit and is of interest, as there is no form similar to it except that from New Zealand with the exception of two specimens noticed by Mr. Heinrich Reis in clay found near Cold Spring, Long Island, which discovery, however, was antedated by that made in the Wildwood material. I have not seen Mr. Reis' specimens, which he identifies as *Triceratum trifoliatum* and do not know, therefore, whether the Wildwood and Cold Spring forms are identical.

Melosira granulata (Ehr.) Ralfs.
Navicula acrosphaeria Rab.
N. affinis Ehr.
N. Americana Ehr.
N. bicapitata Lagerst.
N. Bombus (Ehr.) Kütz.
N. Brebissonii Kütz.
N. columnaris Ehr.
N. Crabro (Ehr.) Kütz.
N. Dactylus Ehr.
N. Dariana A. Schm.
N. decurrens Kütz.
N. distans (W. Sm.) Ralfs.
N. elliptica Kütz.

N. Fischeri A. Schm.
N. formosa Greg.
N. gibba Ehr.
N. Hitchcockii Ehr.
N. humerosa Bréb.
N. Iridis amphirhyncus Ehr.
N. Kamorthensis Grun.
N. latissima Greg.
N. Lewisiana Grev.
N. Liber linearis (Grun.) V. H.
N. limosa Kütz.
N. Lyra Ehr.
N. major Kütz.
N. mesolepta Ehr.
N. mesolepta nodosa Ehr.
N. mesostyla Ehr.
N. nobilis (Ehr.) Kütz.
N. pachyptera Kütz.
N. permagna (Bail.) Edw.
N. peregrina (Ehr.?) Kütz.
N. placentula (Ehr.) Kütz.
N. polyonca Breb.
N. pusilla W. Sm.
N. rhomboides Ehr.
N. sphaerophora Kütz.
N. Smithii Bréb.
N. stauroptera parva Grun.
N. tabellaria Kütz.
N. termitina Ehr.
N. trinodis inflata Schultze.
N. viridis (Nitzsch) Kütz.
Nitzschia Campeachiana Grun.
N. cirumsuta (Bail.) Grun.
N. granulata Grun.
N. salinarum Grun.
N. scalaris (Ehr. ?) W. Sm.
N. Sigma (Kütz), W. Sm.
N. tryblionella maxima Grun.

Odontidium mutabile genuinum Grun.
Plagiogramma tessellatum Grev., rare.
Pleurosigma eximium (Thw.) Grun. and Cl.
P. Sciotoense Sulliv.
P. Spencerii (Quek.) W. Sm.
Polymyxus coronalis L. W. Bail.
Pseudauliscus radiatus Bail.
Pseudoeunotia flexuosa (Breb.) Grun.
Rhaphoneis amphiceros Ehr.
R. Belgica Grun.
R. gemmifera Ehr.
R. Rhombus Ehr.
Stauroneis acuta W. Sm.
S. gracilis Ehr.
S. Phoenicenteron Ehr.
Surirella angusta Kütz.
S. biseriata (Ehr.) Bréb.
S. cruciata A. Schm.
S. crumena Bréb.
S. elegans Ehr.
S. Febigerii Lewis.
S. oblonga Ehr.
S. ovalis Bréb.
S. ovalis ovata (Kütz) V. H.
S. splendida Ehr.
S. striatula Turp.
S. tenera Greg.

SURIRELLA WOOLMANIANA Peticolas, n. sp.

Mr. Peticolas, who discovered several specimens, remarks that it differs from *S. Gemma*, of which I had at first considered it a variety, in " size, outline, areolation and the hyaline centre."

Valves broadly obovate, rounded at both ends; costae slightly twisted, not reaching the median line, thus forming a pseudoraphe broadening at the centre. Costae and intercostate striae much more robust than in *S. Gemma*. It somewhat approaches certain varieties of *S. striatula*.

Synedra delicatissima W. Sm.
S. investiens W. Sm.
Terpsinoe Americana (Bail.) Ralfs.

Tetracyclus emarginatus (Ehr.) W. Sm.
T. lacustris Ralfs.
Triceratium alternans Bail.
T. favus Ehr.
T. sculptum Shadb.

Of the above about 80 are exclusively fresh water forms, 47 exclusively marine, while the others are found in fresh water and brackish or in brackish and marine.

Preliminary Notes on Nelumbo lutea.

By Benj. Heritage.

(Plate 231.)

In August, 1890, being desirous of investigating the root growth of *Nelumbo lutea*, the late Isaac Burk, and self visited the mill-pond at Sharptown, Salem County, N. J., for that purpose.

There were about eight acres thickly covered with the species, which presented a most gorgeous sight.

We procured a boat, and after considerable research, we found a place at which the water was but a few inches in depth, over a very soft mud. He managed the boat, and seating ourself on its bottom, with an arm stripped to the shoulder we selected one of the large leaves which had a flower stalk in close proximity.

These we traced with the hand, down into the ooze, to their common point of attachment, which brought the arm up to the elbow in the mud. There we found a very dense cluster of fibrous roots which were loosened, but this did not release the plant; as there was a horizontal portion, the size of a finger extending from it in opposite directions. The truth then dawned upon us that this majestic plant is stoloniferous!

We traced this horizontal stolon or stem until we accidentally broke it, before reaching its termination in either direction. Its course was quite direct, and lay at a uniform depth of about one foot beneath the surface of the mud.

At short distances we encountered very many other similar subterranean vines or stolons—portions of other plants perhaps